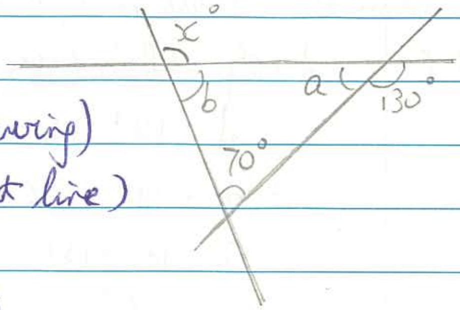
Angles of triangles and straight line. 25/11/2013

Example: Find the unknown angle x.



Method I: (add a and b to the drawing)

$a + 130° = 180°$ (∠s on a straight line)

$a = 50°$

$a + b + 70° = 180°$ (∠s sum of Δ)

$b = 180° - 70° - 50°$

$b = 60°$

$x° + b = 180°$ (∠s on a straight line)

$x° = 180° - 60°$

$x° = 120°$

$x = 120$

Method II.

$a + 130° = 180°$ (∠s on a straight line)

$a = 50°$

$a + 70° = x°$ (ext. ∠ of Δ)

$x° = 70° + 50°$

$x = 120$

Question 1. Method I

$a + 142° = 180°$ (∠s on a st. line)

$a = 38°$

$b + 119° = 180°$ (∠s on a st. line)

$b = 61°$

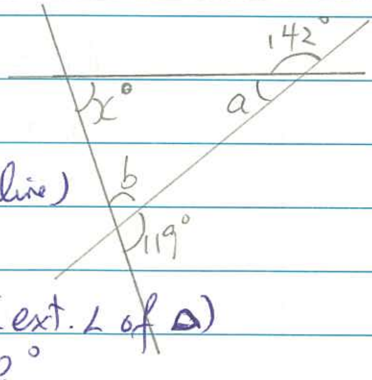
$a + b + x° = 180°$ (∠s sum of Δ)

$x° = 180° - 61° - 38°$

$x° = 81°$

$x = 81$

Method II.



$a + 142° = 180°$ (∠s on a st. line)

$a = 38°$

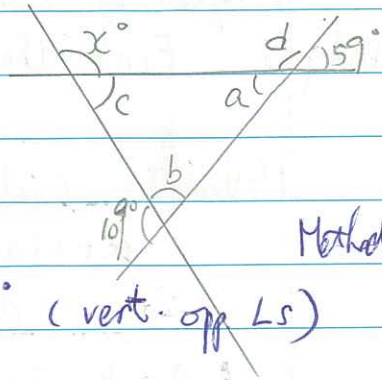
$a + x° = 119°$ (ext. ∠ of Δ)

$x° = 119° - 38°$

$x° = 81°$

$x = 81$

Question 2. (add a, b, c to the diagram)



Method I: ① $d+59=180°$ ($\angle$s on a st. line)

$d=121°$

② $a+d=180°$ ($\angle$s on a st. line)

$a=180-121$

$a=59°$

or

Method II

① $a=59°$ (vert. opp $\angle$s)

③ $b+109°=180°$ ($\angle$s on a st. line)

$b=71°$

② $b+109=180$ ($\angle$s on a st. line)

$b=71°$

④ $a+b+c=180°$ ($\angle$s sum of $\triangle$)

$c=180°-59°-71°$

$c=50°$

⑤ $x°+c=180°$ ($\angle$s on a st line)

$x°=180°-50°$

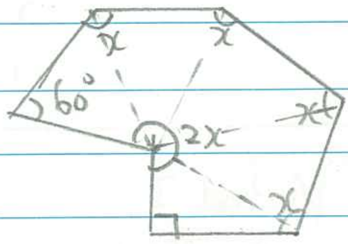
$x=130$.

or ③ $a+b=x$ (ext. $\angle$ of $\triangle$)

$59+71=x$

$x=130$

Question 3.



$60°+90°+6x=180\times5$ ($\angle$s sum of int. $\angle$s of polygon)

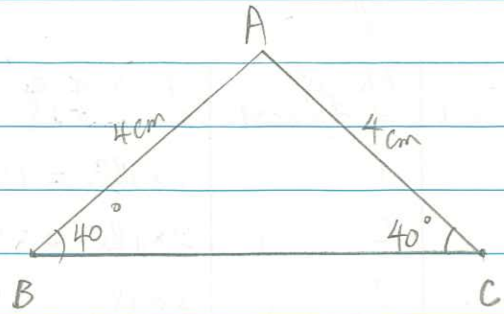
$6x=900°-150°$

$x=750°\div6$

$x=125°$

New Trend Ex 3C (2. 4b and 7) 28/11/2013

2.(a)



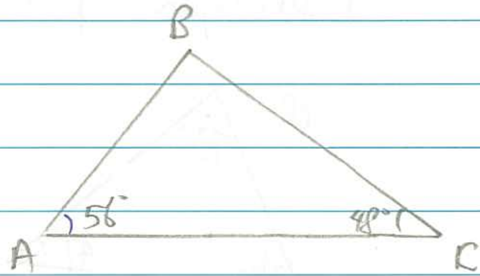
AB = 4cm
AC = 4cm

b) According to the lengths of sides of $\triangle ABC$, it is an isosceles triangle. since two side of the triangle are the same also the base angle are the same / equal.

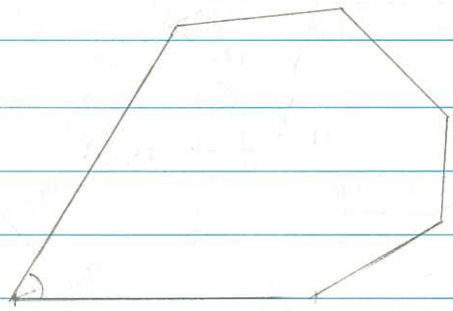
4. $\angle B + 56^\circ + 48^\circ = 180^\circ$ ($\angle$s sum of $\triangle$)

$\angle B = 180^\circ - 56^\circ - 48^\circ$

$\angle B = 76^\circ$

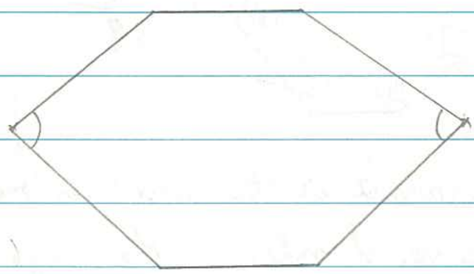


7a)



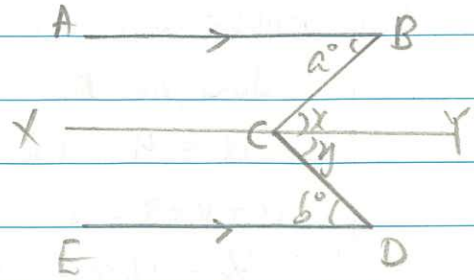
accept any reasonable drawing

b)



H&H Ch14H (2, 7) 4/2/2013

2. Method I. (by adding in another line)



Proof: $B\hat{C}D = a + b$

By adding in a line $XY \parallel AB \parallel ED$

$\angle BCD = x + y$

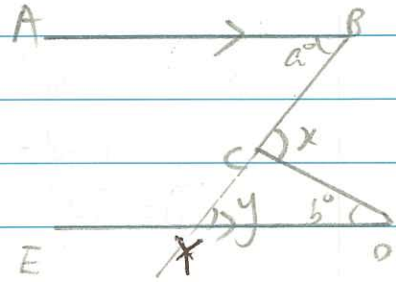
$x = a$ (alt. $\angle s$, $AB \parallel XY$)

$y = b$ (alt. $\angle s$, $XY \parallel ED$)

$\therefore$ $x + y = a + b$

$\angle BCD = a + b$

Method II. (by extending an existing line segment)



To prove $B\hat{C}D = a^\circ + b^\circ$

Proof:

Extend BC to meet ED at the point Y

$y = a^\circ$ (alt $\angle s$, $AB \parallel DE$)

$y + b = x$ (ext $\angle s$ of $\triangle$)

$\therefore$ $y = a$

$\therefore$ $y + b = a + b = x$

$\angle BCD = a + b$ //

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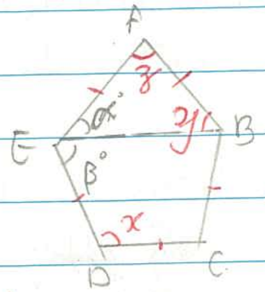
10 Quick question.

1. $x = 180^\circ - 54^\circ = 126^\circ$
2. $x = 135^\circ$
3. $x = 137^\circ$
4. $x = 119^\circ$
5. $x = 117^\circ$
6. $x = 180^\circ - 78 = 102^\circ$
7. $x = 124^\circ$
8. $x = 127^\circ$
9. $x = 128^\circ$
10. $180^\circ - 68^\circ = 112^\circ$



7(a) ABCDE is a regular pentagon

Since $AE = AB$

① $\alpha = y$ (base ∠s of isos Δ)

② $\alpha + y + z = 180°$ (∠s sum of Δ)

③ $z = (180 \times 3) \div 5$ (∠s sum of polygon)

$z = 540 \div 5$

$z = 108°$

∴ $\alpha + y + 108° = 180°$

$2\alpha + 108° = 180$

$2\alpha = 72°$

$\alpha = 36°$

$\alpha + \beta = 108°$ (int ∠s of ~~p~~ regular ~~polygon~~ pentagon)

$\beta = 108 - 36°$

$\beta = 72°$

b) ~~Proof~~

To prove $EB \parallel DC$

$x = 108°$ (~~∠s~~ int ∠s of regular ~~pt~~ pentagon)

$x + \beta = 108° + 72°$

$= 180$

∴ The co-interior ∠ sum is 180°

∴ $EB \parallel DC$